

Preliminary Amendment

National Stage Entry of PCT/JP2004/009009408

Attorney Docket No.: Q87066

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (original): An apparatus configured to receive an expendable from an expendable container with a piezoelectric element attached, the apparatus comprising:

a detection signal generation circuit configured to charge and discharge the piezoelectric element, and generate a detection signal including information representing a cycle of remaining vibration of the piezoelectric element after a lapse of a predetermined standby time from a completion of the discharge; and

a controller configured to generate a clock signal, and control the charge and the discharge of the piezoelectric element, wherein

the cycle is available for determining whether a residual quantity of the expendable is greater than a preset level, and

the controller is configured to determine the predetermined standby time by counting a number of pulses in the clock signal.

2. (original): The apparatus in accordance with claim 1, wherein the controller is capable of changing the predetermined standby time.

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3. (original): An expendable container capable of measuring a residual quantity of stored expendable, the expendable container comprising:

an expendable tank configured to store the expendable and have a piezoelectric element attached;

a detection signal generation circuit configured to charge and discharge the piezoelectric element, and generate a detection signal including information representing a cycle of remaining vibration of the piezoelectric element after a lapse of a predetermined standby time from a completion of the discharge; and

a controller configured to generate a clock signal, and control the charge and the discharge of the piezoelectric element, wherein

the cycle is available for determining whether a residual quantity of the expendable is greater than a preset level, and

the controller is configured to determine the predetermined standby time by counting a number of pulses in the clock signal.

4. (original): The expendable container in accordance with claim 3, wherein
the controller is capable of changing the predetermined
standby time.

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5. (currently amended): The expendable container in accordance with ~~any of claim 3~~
~~and 4~~ claim 3, wherein

the controller generates the clock signal in response to a signal provided from outside of the expendable container.

6. (original): An expendable container capable of measuring a residual quantity of stored expendable, the expendable container comprising:

an expendable tank configured to store the expendable; and

a piezoelectric element attached to the expendable tank,

wherein

the piezoelectric element is configured to charge and discharge in response to an electric current provided from an outside apparatus, and output a voltage wave only in an predetermined frequency in response to a remaining vibration of the piezoelectric element after a lapse of a predetermined standby time from a completion of the discharge, wherein

the predetermined frequency is available for determining whether a residual quantity of the expendable is greater than a

preset level, and

the predetermined standby time is determined by counting a number of pulses in a clock signal generated by the outside apparatus.

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7. (original): A method of measuring a residual quantity of expendable stored in an expendable container, the method comprising the steps of:

(a) providing an expendable tank configured to store the expendable and have a piezoelectric element attached, and a circuit configured to charge and discharge the piezoelectric element;

(b) generating a clock signal;

(c) charging the piezoelectric element;

(d) discharging the piezoelectric element;

(e) waiting a lapse of a predetermined standby time from a completion of the discharge;

(f) generating a detection signal including information representing a cycle of remaining vibration of the piezoelectric element after the lapse of a predetermined standby time;

(g) determining whether a residual quantity of the expendable stored in the expendable tank is greater than a preset level, according to the detection signal; and
the step (e) includes the step of determining the predetermined standby time by counting a number of pulses in the clock signal.

8. (new): The method in accordance with claim 7, wherein the step (e) further includes the step of changing the predetermined standby time.

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9. (new): The expendable container in accordance with claim 4, wherein the controller generates the clock signal in response to a signal provided from outside of the expendable container.